Remarks

The various parts of the Office Action (and other matters, if any) are discussed below under appropriate headings.

Claim Rejections - 35 USC § 101

Claims 19 was rejected under 35 U.S.C. § 101 because the claimed invention was directed to non-statutory subject matter. Claim 19 has been amended for clarity, thereby rendering moot the rejection. Therefore, the rejection should be withdrawn.

Claim Rejections - 35 USC § 102 and § 103

Claim 1, as amended, recites a method of computer-assisted medical navigation or pre-operative treatment planning that includes, *inter alia*, creating patient-specific body structure data, wherein creating the patient-specific body structure data includes adapting a three-dimensional generic model by data linking the three-dimensional generic model with patient-characteristic, two-dimensional detection data; and assigning the detected positions to the created patient-specific body structure data

In addition to the deficiencies of Schweikard discussed in the previous reply (e.g., Schweikard fails to disclose or fairly suggest creating patient-specific body structure data by adapting a three-dimensional generic model by data linking the generic model with patient-characteristic, two-dimensional detection data[1]), it is noted that **U.S. Patent App. Pub. No. 2004/0082849 is not prior art** because its effective date as a reference is April 29, 2004, which is after the filing date and the priority dates associated with the present application. Schweikard is not entitled to the international filing date of July 31, 2001 because the resultant published PCT application was not published in English. See MPEP 706.02(f).

In addition, the rejection of claim 1 based on Van Der Brug should be withdrawn. Van Der Brug fails to disclose or fairly suggest creating patient-specific body structure data by adapting a three-dimensional generic model by data linking with patient-characteristic two-dimensional detection data.

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[1] Par. [0050] is not understood to disclose use of generic model. Rather it discusses use of a preoperative MR image of the patient body part.

On page 2 of the Office Action, the Examiner asserts that "CT image data in '648 (col. 4, lines 9-14) . . . does suggest use of a 3D generic model." It is respectfully submitted that this interpretation is not supported by Van Der Brug. For convenience of reference, col. 4, lines 9-14 of Van Der Brug is provided below.

Col. 4, lines 9-14

> The computer 21 also computes the corresponding position of the surgical instrument 11 in an earlier generated image such as a CT image or an MRI image. The CT data and/or MRI data are stored in a memory unit 23.

The above portion of Van Der Brug is in no way suggestive of making use of generic data, let alone the claim 1 recitation of creating patient-specific body structure data by adapting a three-dimensional generic model by data linking with patient-characteristic two-dimensional detection data.

For at least this reason, the rejection cannot be maintained, and should be withdrawn.

Claims 1-19 and 21-22 stand rejected pursuant to 35 U.S.C. § 102(e) as being anticipated by Simon et al., U.S. Patent No. 6,470,207 B1.

Simon is not understood to disclose or fairly suggest the method recited in claim 1, including creating the patient-specific body structure data, which includes adapting a three-dimensional generic model by data linking the three-dimensional generic model with patient-characteristic, two-dimensional detection data.

While Simon et al. discloses use of "atlas data"[2] as the source of a previously-obtained image, Simon's disclosed use of atlas data differs from the use of the generic model of the claimed invention. As clarified in amended claims 1 and 19, the generic model is adapted to create patient-specific body structure data by data linking the three-dimensional generic model with patient-characteristic, two-dimensional detection data. In contrast, Simon et al. is not understood to disclose or fairly suggest the step of creating patient-specific body structure data by adapting a three-dimensional generic model by data linking the three-dimensional generic model with patient-characteristic,

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[2] Simon et al. defines atlas data as "non-patient specific three-dimensional data describing a 'generic' patient." (Co. 14, In. 19-20.)

two-dimensional detection data, as recited in amended independent claims 1 and 19 and the various dependent claims.

At page 3 of the Office Action, the Examiner states that, "it is also disclosed that adapting is accomplished by linking the 3D model to various forms of existing patient-characteristic data (col. 16, line 40 - col. 17, line 23)." This portion of Simon has not been found to disclose or suggest that which is recited in claim 1. In fact, at col. 16, lines 53-64, Simon states the following.

> When a DRR image is created, a fluoroscopic image is formed by computationally projecting volume elements (voxels) of the 3D CT data set onto a selected image plane. Using a *3D CT data set of a given patient*, it is possible to create a DRR image that appears very similar to a corresponding *x-ray image of the same patient*. A requirement for this similarity is that the "computational x-ray imager" and actual x-ray imager use similar intrinsic imaging parameters (e.g., projection transformations, distortion correction) and extrinsic imaging parameters (e.g., view direction). The intrinsic imaging parameters can be derived from the calibration process. (Emphasis added).

In other words, the portion of Simon relied upon by the Examiner discusses using a 3D data set **of the patient** and creating a DRR image that appears very similar to a **corresponding x-ray image of the same patient**. This is no way is suggestive of the claim 1 recitation of adapting a three-dimensional generic model by data linking the three-dimensional generic model with patient-characteristic, two-dimensional detection data.

Because Simon fails to disclose or suggest each and every element of amended claim 1, the anticipation rejection of claim 1 and dependent claims 3-18 and 21-22 should be withdrawn.

Similarly, claim 19, as amended, recites, *inter alia*, a computer-readable medium storing a computer program, wherein when the program is loaded into a memory of a computer and executed, causes the computer to carry out the steps of detecting a position of a patient or a part of a patient's body, detecting positions of medical treatment devices or treatment-assisting devices, and creating patient-specific body structure data, wherein creating the patient-specific body structure data includes adapting a three-dimensional generic model by data linking the three-dimensional generic model with patient-characteristic, two-dimensional detection data.

The rejection of claim 19 should be withdrawn for at least the reasons discused above with respect to claim 1. As is discussed above, none of the references applied by the Examiner have been found to disclose or suggest a computer program that causes a computer to create patient-specific body structure data by adapting a three-dimensional generic model by data linking the three-dimensional generic model with patient-characteristic, two-dimensional detection data.

Therefore, the rejection of claim 19 should be withdrawn.

New claim 24 recites a method for computer-assisted medical navigation or pre-operative treatment planning that includes creating patient-specific body structure data, wherein creating the patient-specific body structure data includes adapting a three-dimensional generic model by data linking the three-dimensional generic model with patient-characteristic, two-dimensional detection data, and wherein the generic model includes a statistical model of the body structure based on statistical evaluations of a number of image data sets.

None of the references applied by the Examiner have been found to disclose or fairly suggest the claimed method including creating patient-specific body structure data, wherein creating the patient-specific body structure data includes adapting a three-dimensional generic model by data linking the three-dimensional generic model with patient-characteristic, two-dimensional detection data, and wherein the generic model includes a statistical model of the body structure based on statistical evaluations of a number of image data sets.

Therefore, it is respectfully submitted that claim 24 is in condition for allowance.

Telephone Interview

In the interests of advancing this application to issue and compact prosecution, it is respectfully requested that the Examiner telephone the undersigned to discuss any of the foregoing with which there may be some controversy or confusion or to make any suggestions that the Examiner may have to place the application in condition for allowance.

Conclusion

In view of the foregoing, request is made for timely issuance of a notice of allowance.

Respectfully submitted,

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